

**Green Generation  
Cobra Invitational – Division B  
January 30, 2016**

**Team Name** \_\_\_\_\_

**Team #** \_\_\_\_\_

**School** \_\_\_\_\_

**Raw score (out of 50)** \_\_\_\_\_ **(Tie breakers do not count in the raw score)**

**Any tie breakers?** \_\_\_\_\_

**Rank** \_\_\_\_\_

**Part I: General Principles of Ecology**

**Use word bank below to answer questions 1 to 10.**

- a. Carrying capacity
- b. Immigration
- c. Emigration
- d. Commensalism
- e. Parasitism
- f. Ecology
- g. Population
- h. Population crash
- i. Exponential growth curve
- j. Logistic (s) growth curve
- k. Carnivore
- l. Omnivore
- m. Food chain
- n. Food web
- o. Biosphere
- p. Nitrogen cycle
- q. Hydrologic cycle

- \_\_\_\_\_ 1. The movement of Individuals out of population.
- \_\_\_\_\_ 2. The maximum number of organisms that an environment can support.
- \_\_\_\_\_ 3. A type of symbiosis in which one organism benefits and the other one is neither harmed nor helped.
- \_\_\_\_\_ 4. The study of interactions between living things and their environment both biotic and abiotic.
- \_\_\_\_\_ 5. A group of organisms of the same species that live in the same geographical area at the same time.

- \_\_\_\_\_ 6. Growth that occurs at a rapid rate of increase over a period of time.
- \_\_\_\_\_ 7. Any animal that eats flesh.
- \_\_\_\_\_ 8. The system of interconnected food chain in a community.
- \_\_\_\_\_ 9. All of the earth's communities.
- \_\_\_\_\_ 10. Enters atmosphere by transpiration, evaporation; exits as precipitation

### **Multiple Choices**

- 11. During the exponential growth phase of bacterial growth, the population,
  - a. Increase moderately
  - b. Increase dramatically
  - c. Decrease moderately
  - d. Decrease dramatically
  - e. Does not change
- 12. Competition for resources, within a population is called,
  - a. Intraspecific competition
  - b. Mutualism
  - c. Neutral
  - d. Interaction
  - e. Interspecific competition
- 13. The local environment in which species lives is its,
  - a. Ecosystem
  - b. Habitat
  - c. Fundamental niche
  - d. realized niche
  - e. Niche
- 14. Resource partitioning results in,
  - a. Extinction of the least adapted species
  - b. Interspecific breeding
  - c. Reduced competition among coexisting species
  - d. Increased competition among coexisting species
  - e. Competition for niche among similar species
- 15. All food energy in the biosphere is ultimately provided by,
  - a. Producers
  - b. Consumers
  - c. Nitrogen fixers
  - d. Phosphorus fixers
  - e. Decomposers
- 16. Which pyramid compares the total dry weight of the organisms in each trophic level,
  - a. Number pyramid
  - b. Biomass pyramid
  - c. Energy pyramid
  - d. Ecological pyramid
  - e. Food pyramid
- 17. Phosphorus enters aquatic communities by means of
  - a. Decomposers
  - b. Producers
  - c. Primary consumer
  - d. Secondary consumers
  - e. Erosion

18. Referring the figure below suppose 10,000 units of energy are available at the level of the grass, what is the total number of energy units lost by the time energy reaches the Coyote? **Remember 90% of energy is lost at every tropic level.**

Grass (tropic level 1) → Rat (tropic level 2) → Cat (tropic level 3) → Coyote (tropic level 3)

- a. 9,900 units
  - b. 990 units
  - c. 90 units
  - d. 9,990 units
  - e. 1 unit
19. Select all that apply. Which of the following would be positioned at the top of a typical energy flow pyramid?
- a. Producer
  - b. Consumer
  - c. the tropic level with the greatest biomass
  - d. tropic level with the least number
  - e. tropic level with the least energy
20. Select all that apply. The main collector(s) of the solar energy used to power life processes is/are the
- a. producers
  - b. atmosphere
  - c. hydrosphere
  - d. green leaves
  - e. photosynthetic organisms

## Part II: Problems resulting from human impact

### Matching

- |                               |   |
|-------------------------------|---|
| _____ 21. organic pollution   | a. radioactive materials  |
| _____ 22. inorganic pollution | b. waste heat from industrial and power generation processes              |
| _____ 23. toxic pollution     | c. heavy metals and other chemical compounds that are lethal to organisms |
| _____ 24. thermal pollution   | d. dissolved and suspended solids as silt, salts, and minerals            |
| _____ 25. radiation pollution | e. decomposition of living organisms and their bi-products                |

Biomes are often characterized by the amount of rain they receive. Identify the following Biomes:

- |  |                         |
|--|-------------------------|
| _____ 26. >500 cm of rain per year       | a. Grassland            |
| _____ 27. <25 cm of rain per year (warm) | b. Tundra               |
| _____ 28. 25 - 75 cm of rain per year    | c. Desert               |
| _____ 29. <25 cm of rain per year (cold) | d. Deciduous Forest     |
| _____ 30. 70 - 150 cm of rain per year   | e. Tropical Rain Forest |

**Fill in the blanks:**

31. The four components of soil are:

\_\_\_\_\_

\_\_\_\_\_

32. Three causes of desertification include:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

33. Most common chemicals involved in causing soil pollution are:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

34. Major causes of Deforestation (**at least 3**)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

35. Causes of Soil Pollution (**at least 3**)

\_\_\_\_\_

\_\_\_\_\_

**Multiple choices:**

36. Which of the following practices would have the biggest impact on achieving global sustainability?

- |                                  |                                   |
|----------------------------------|-----------------------------------|
| a. Recycling aluminum cans       | d. Reducing human population size |
| b. Using fuel-efficient vehicles | e. Developing ecotourism venues   |
| c. Replanting deforested areas   |                                   |

37. Which of the following is the correct order of soil particles in order of increasing size?

- |                    |                   |
|--------------------|-------------------|
| a. Clay —sand—silt | d. Sand—silt—clay |
| b. Clay—silt—sand  | e. Silt—clay—sand |
| c. Sand—clay—silt  |                   |

38. Which of the following is **NOT** a type of pollution?

- a. Water Pollution
- b. Noise Pollution
- c. Oxygen Pollution
- d. Soil Pollution
- e. Radioactive Pollution

39. Organisms in this biome must tolerate highly variable conditions.

- a. Tropical Forest
- b. Tundra
- c. Savanna
- d. Grassland
- e. Estuary

40. The Great Green Wall is a project in Africa that consists of planting a wall of trees to try to prevent the spread of a particular environmental problem. Which is the main problem the Great Green Wall is aiming to prevent?

- a. Deforestation
- b. Soil pollution
- c. Air pollution
- d. Desertification
- e. high population

### **Part III: Solutions to reducing harmful effects**

#### **Multiple Choice:**

41. The process of composting

- a. uses synthetic materials
- b. has little potential to conserve landfill space.
- c. is always carried out in city-ran facilities
- d. could effectively handle variety of waste

42. Which of the following produces the most solid waste,

- a. manufacturing
- b. plastic packaging
- c. agriculture
- d. nuclear power plants.

43. Which items makes the largest percentage of waste produced by households and businesses?

- a. aluminum cans
- b. plastic bottles and packaging
- c. paper products
- d. yard waste, such as grass clippings, tree

limbs

44. Which of the following is not considered hazardous waste?

- a. dead batteries such as those used in flashlights and radios
- b. rotting meat and other food waste
- c. metals such as lead and mercury

d. both (a) and (c)

45. Making product from recycled materials,

a. is limited to metals

b. often saves energy and other resources during the manufacturing process.

c. uses so much energy that it is not economically workable

d. none of the above.

46. The fastest growing renewable energy resource today is

a. nuclear

b. coal

c. wind

d. geothermal

47. Which of the following terms is not a unit of power?

a. Watt

b. Horsepower

c. Joule

d. All are units of power

**Short Answers:**

48. What is the tragedy of the commons?

49. How can the tragedy of the commons be prevented?

50. Why is a nonpoint source more difficult to control than a point source?

**Tie breaker questions.**

51. Composting is most closely related to:

a. Nutrient Cycling

b. Natural service

c. Reusing

d. Garbage service

52. The methane found in landfills is a gas that

a. is produced when wastes react with oxygen

b. must be pumped to the surface in leachate pipes

c. is a major contaminant of groundwater supplies

d. may be captured and used to produce energy.

53. Energy derived from fossil fuels supplies approximately what percentage of the world's energy need?

- a. 10%
- b. 50%
- c. 85%
- d. 99%

54. A grove of trees that originated from one seed displays

- a. uniform dispersion
- b. random dispersion
- c. clumped dispersion
- d. no dispersion pattern
- e. a form of dispersion not found in nature

55. Select all that apply. Most carbon is fixed \_\_\_\_\_ and liberated \_\_\_\_\_

- a. in proteins / as organic compounds.
- b. in CO<sub>2</sub> / as complex compounds
- c. in complex compounds / as CO<sub>2</sub>.
- d. in humus / by cyanobacteria.
- e. by plants / by plants